REMARKS/ARGUMENTS

Prior to this Amendment, claims 1-16, 18, and 19 were pending in the application.

Independent claims 1, 6, 8, and 16 are amended to address rejections under 35 U.S.C. §101.

Claims 1-16, 18, and 19 remain in the application for consideration by the Examiner.

Claim Rejections Under 35 U.S.C. §101

In the June 27, 2005 Office Action, claims 1-7 and 8-16 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Independent claims 1, 6, 8, and 16 are amended to address this rejection.

Claim Rejections Under 35 U.S.C. §103

In the Office Action of June 27, 2005, claims 1-2, 8 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,014,220 ("McMann") in view of "Understanding Fault-Tolerant Distributed Systems" ("Cristian". This rejection is traversed based on the following remarks.

As discussed in Applicant's Background, the present invention is addressing the problems with prior network modeling techniques that were limited to modeling of hardware devices and their failures and repair. The present invention in contrast provides for availability modeling of software components or applications in the network and typically, integrating such availability modeling of software components with the modeling of hardware devices to provide a more accurate availability model for a network device or node and the overall network.

With the most recent Office Action, McMann is presented and used as the base or main reference in rejecting all of the claims as being obvious (i.e., all pending claims are rejected based on McMann in view of additional references). Applicant believes that McMann teaches the more standard modeling technique that Applicant discusses in its Background and hence, McMann is not effective as providing a base reference for rejecting the pending claims.

More specifically, McMann teaches a hardware-based reliability model generator that can build models using user selected hardware components or modules. However, McMann provides no teaching of modeling software as a component in its reliability models of networks or computer systems. The lack of

teaching of modeling software as a component in a network or system can be seen in a review of McMann with reference to Figure 2, which shows that the input for the model builder 202 is provided by knowledge bases 214 and 216. Reading McMann from col. 8, line 17 to col. 9, line 43, it can be seen that components described in detail are only hardware components and no discussion of software applications and their failure modes or recovery is provided by McMann. Further, McMann in Figure 4A shows "a typical computer system which may be represented in the BBD 214" (see, McMann beginning at col. 9, line 44). As shown in Figures 4A and 4B and described in associated portions of the specification, McMann only teaches modeling hardware components (i.e., a system 402, a computer 404, I/O devices 407, a CPU 406, memory 408, ALU 410, and registers 412). There is not even a suggestion that it would be useful to also model software in the computer 404 as part of the reliability model 210 generated by model builder 202.

Referring now to specific claim language in claim 1, the data structure includes "a **software** availability model" including "an aggregated rate for each of said classes of failures for said **at least one software component** and an aggregated repair time for each of said classes of failures for said **at least one software component**." As discussed above, McMann fails to teach that any of the components defined and stored in the knowledge bases 214, 216 for inclusion in the model 210 is a "software component" as called for in claim 1. The Office Action states that McMann teaches the availability models of claim 1 but only discusses McMann's teaching of analyzing components of a system, but as will be understood from a study of McMann with reference to Figures 2-4B and elsewhere, McMann's "components" are NOT software components. Hence, this key aspect of the Applicants' invention is not shown or suggested by McMann.

Further, the software availability model of the date structure of claim 1 includes aggregated failure rates for each of a set of classes of failures for a software component in a computer platform. More particularly, claim 1 is specifies what types of specific failure classes may be included and modeled with aggregated failure rates. The Office Action notes that McMann does not teach these failure modes and cites Cristian for teaching the four failure modes in claim 1. However, Cristian fails to overcome the deficiencies of McMann noted above, and particularly, fails to teach a software availability model included in a platform availability model such that software components are modeled with other components in a model of a

network. Hence, the combined teaching of McMann and Cristian does not make claim 1 obvious and would not result in the claimed invention. Yet further, Cristian as cited in the Office Action is only discussing hardware failure modes (such as server failure). Hence, the combined teaching of these two references fails to discuss modeling of software components in a network. As a result, Applicants request that the rejection of claim 1 be withdrawn.

Yet further, the software availability model included aggregated failure rates for each of a set of classes of failures of software components. The Examiner cites McMann for teaching the concept of placing failures into classes but at the citation McMann discusses "sets of components" but not sets of or classes of failures for its hardware components. Hence, there is no teaching here or elsewhere in McMann that failures for any component, and particularly, a software component, should be placed into a set of classes, that failure rates for each class should be determined for each software component in the class, and the rates then aggregated as called for in claim 1. For this additional reason, McMann fails to teach each and every limitation of claim 1.

Claim 2 depends from claim 1 and is believed allowable at least for the reasons for allowing claim 1. However, McMann fails to teach the **software** availability model as discussed with reference to claim 1, and further, there is no teaching in McMann that the platform parameters <u>define platform problems causing failures and affecting recovery times related to the platform problems</u>. Further, McMann does not teach that "at least a portion of the platform parameters are used to determine the aggregated repair time" that would include repair of the at least one software component with McMann not teaching the determination of such an aggregate repair time including repair of a software component nor using platform parameters to determine it. The Office Action cites recovery and other actions related to the McMann "components" but as discussed with reference to claim 1, the McMann components are hardware components and not software components. Hence, McMann fails to teach each element of claim 2, and the rejection should be withdrawn.

Independent claims 8 and 18, as with claim 1, are directed to modeling a network that includes modeling software components. McMann fails to teach modeling of software components but, instead, only discusses hardware components in its reliability model. Cristian does not overcome this problem of

McMann as it discusses failure modes of servers. Hence, the combination of these references fails to teach determining failure rates and recovery rates for a software component. Further, these references fail to teach generating warm and non-warm recoverable error state parameters for a **software** component and then, as called for in claim 8, generating an availability model that includes such state parameters for the software component. For these reasons, Applicants request that the rejection of claims 8 and 18 based on these two references be withdrawn.

Additionally, in the Office Action, claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Cristian further in view of U.S. Patent No. 4,870,575 ("Rutenberg"). Claim 3 depends from claim 1 and is believed allowable as depending from an allowable claim, and Rutenberg fails to overcome the deficiencies of McMann and Cristian as discussed in reference to claim 1.

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Cristian further in view of "Survey of Software Tools for Evaluating Reliability, Availability, and Serviceabiilty" ("Malek"). Claim 4 depends from and is believed allowable as depending from an allowable claim, and Malek fails to overcome the deficiencies of McMann and Cristian as discussed in reference to claim 1.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Cristian further in view of "Availability analysis of a certain class of distributed computer systems under the influence of hardware and software faults" ("Hassapis"). Claim 4 depends from and is believed allowable as depending from an allowable claim, and Hassapis fails to overcome the deficiencies of McMann and Cristian as discussed in reference to claim 1.

In the Office Action, independent claims 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Hassapis. This rejection is traversed based on the following remarks.

Independent claim 6 calls for a "software availability model" that models repair time "for each software component." As discussed with reference to claim 1, McMann fails to teach a "software" availability model but instead teaches only a hardware-based model. Hassapis fails to teach in its availability analysis on page 525 a software availability model that includes "an aggregated failure rate" for each software component on a node. Further, Hassapis does not teach that its analysis

uses "aggregated repair time" for each software component on a node but instead shows use in a stochastic process "0" if a computer module is under repair at a particular time and "1" if the computer module is functioning at that time. For these reasons, the combination of McMann and Hassapis fails to teach or suggest each limitation of claim 6. Claim 7 depends from claim 6 and is believed allowable as depending from an allowable base claim.

In the Office Action, claims 9-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Cristian further in view of Malek. Claims 9-12 depend from claim 8 and are believed allowable as depending from an allowable base claim. Further, Malek fails to overcome the deficiencies of McMann and Cristian discussed with reference to claim 8.

In the Office Action, claims 16 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over McMann in view of Malek. This rejection is traversed based on the following remarks.

As discussed with reference to claim 1, McMann fails to teach modeling of a software components, and thus, with reference to claim 16, McMann fails to discuss any of the steps that describe processing information regarding "a software error" within a network model (i.e., McMann fails to show determining a recoverable state for a software error, a failure rate for a software error, and a recovery rate for a software error as called for in claim 16). Malek does not overcome this deficiency of McMann and hence, the combination does not teach claim 16.

Further, the Office Action cites Malek as teaching determining a fraction of recovery failures for warm and non-warm recoveries for the software error with its mean time to repair (MTTR) calculation. However, a mean time to repair defines, generally, the time to repair or overcome a problem. The Malek MTTR does not teach a fraction of "failures" from recovery, i.e., a fraction of times that recovery is not successful. Hence, nowhere in Malek is a value of "a number of failures to recover from said error" discussed, and such a value is not part of the MTTR. The Examiner construes "Pdiag" as teaching this concept as this variable is addressing the probability the diagnostics will be effective, but Applicants could find no indication that such a probability is calculated in the same fashion as the fraction of recovery is defined in claim 16. Further, the Pdiag is not incorporated in a "recoverable state" for a software error but is instead used to determine the MTTR. For this additional reason, claim 16 is believed allowable over Malek.

Claim 19 is directed to a computer program product with limitations similar to that of claim 16, and the reasons provided for allowing claim 16 are believed equally applicable to claim 19.

Conclusions

In view of all of the above, Applicant requests that a timely Notice of Allowance be issued in this case.

No fee is believed due for this submittal. However, any fee deficiency associated with this submittal may be charged to Deposit Account No. 50-1123.

Respectfully submitted,

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